TAG FAMILY OF PRODUCTS

USER GUIDE

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Important Safety Information

For your safety and protection, read this entire manual before you attempt to use the server. In particular, read this safety section carefully. Keep this safety information where you can refer to it if necessary.

Types of Warnings Used in this Manual

This section introduces the various types of warnings used in this guide to alert you to possible safety hazards.

⚠ DANGER

Indicates an imminently hazardous situation, which, if not avoided, will result in death or serious injury.

⚠ WARNING

Indicates a potentially hazardous situation, which, if not avoided, could result in serious injury.

⚠ CAUTION

Indicates a potentially hazardous situation, which, if not avoided, may result in minor or moderate injury.

CAUTION

Indicates a situation or practice that might result in property damage.

About This Manual

Scope and Audience

This manual provides information on the TAG family of servers and is intended for use by system operators. TAG servers are highly customizable; the specific components vary depending on the mission requirements. The purpose of this document is to provide you with an overview of the typical configuration found in the TAG family of servers. Information is also provided on how to identify your specific configuration. Procedural information is included on how to remove and replace system memory as well as hot-swappable components.

Organization

This manual is divided into the following chapters and appendix:

- Chapter 1 – *TAG Server Overview* provides a high-level overview of the TAG 1U, 2U, and 4U servers.
- Chapter 2 – *Server Components* provides a detailed information on the external and internal server components.
- Chapter 3 – *Upgrading Memory and Replacing Hot-swap Components* provides procedures for replacing hot-swappable components and replacing or adding system memory.
- Chapter 4 – *RAIDs* provides a high-level overview that defines RAID, the advantages and disadvantages of various RAID levels, and guidelines to observe when implementing RAID.
- Chapter 5 – *Monitors and Keyboards* provides an overview of ruggedized, rack-mounted monitors, keyboards, and monitor/keyboard combinations manufactured by TAG. Procedures are provided on how to adjust monitor display settings.

Revision Record

Revision	Date of Issue	Scope
1	January 24, 2006	Initial Release

About TAG

Summary of Qualifications

Providing engineering services and solutions for our national defense and homeland security is a responsibility that we don't take lightly. TAG is a recognized industry leader in developing defense technologies and advanced electronics that support some of the most complex solutions for battlespace information networks and management systems in the world.

Our customers depend on our expertise to translate functional requirements and performance objectives into specific design criteria for individual elements and sub-systems that comprise larger mission critical systems. For more than twenty years, we have dedicated our experience in engineering to the design of innovative tactical solutions for military and government, and to providing a wide range of enterprise services and Information Assurance in support of the Defense Information Systems Agency's (DISA) Net-Centric initiatives.

Core Competencies

TAG designs, manufactures, and supports advanced communications electronics as well as integrates, operates, and supports the users of defense communication and information networks for several technology programs in the United States and abroad. TAG has two operating segments consisting of the Tactical Systems and Information and Engineering Services business units;

Tactical Systems provides mechanical, electrical, and thermal engineering for the design and development of MIL-STD certified electronic data enabled systems that are built for in-theater survivability and communication capability over joint enterprise platforms such as DSN, GIG, STEP, GBS, and JTRS. This includes the custom ruggedization of commercial-off-the-shelf (COTS) and non-developmental items (NDI). TAG's mechanical engineering division designs and fabricates custom hardened enclosures, using high performance metal materials, to house and protect a variety of sensitive devices and controls. TAG's electrical engineering division designs programmable power solutions and advanced sensor technologies including digital receivers, advanced digital signal processors and thermal detection systems. TAG's thermal

engineering applies survivability techniques to ensure systems and instruments are designed to withstand harsh environmental conditions encountered by land-based, airborne, and shipboard system in operations.

Information and Engineering Services provides a wide range of customer support operations, enterprise network and communications engineering services combining the experience and expertise required to achieve network and communication interoperability for component hardware and software elements. This includes design, simulation, analysis, and testing of the components or systems for the support of command and control operations. Our team of national security cleared network engineering professionals provides planning support for information systems, architectures, and networks while developing strategies that lay the groundwork for sound technical foundations for programmatic plans. Our expertise in analyzing, designing, implementing, and managing network, telecommunication and security solutions addresses the full lifecycle approach to providing mission oriented enterprise class services.

Contacting TAG

TAG provides online technical support on our Website at **www.tag.com**. Here you will find:

- Reference Guides
- Drivers & Utilities
- Technical Bulletins
- Frequently Asked Questions (FAQs)
- Shipping/Return Material Authorization (RMA) Policy

TAG's Technical Support Call Center is manned 24-hours-a-day by certified TAG Production Line Engineers. TAG's global presence extends to WORLDWIDE on-site system setup and on-site technical support. For more information, contact TAG Technical Coordinator's at 1-877-TAG-TECH (824-8324).

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Chapter 1
TAG Server Overview

This chapter provides an introductory overview of the TAG family of tactical servers. TAG servers are highly customizable; the specific components vary depending on the mission requirements. Your system may contain components not described in this chapter. For detailed information on these components, refer to the manufactures website or contact TAG Technical Support at **tech.support@tag.com**. For more information, see *Contacting TAG* on page vii.

Overview

TAG's tactical servers combine Intel® Xeon® technology with state-of-the-art mechanical, thermal and electrical engineering to create customized systems that perform above and beyond end user or program specifications. Our tactical servers are designed to meet and exceed many MIL-STD requirements to ensure survivability in the field.

Product Highlights

The following list provides an overview of features incorporated into all TAG servers.

- Available with single or dual Intel Xeon processors
- Designed to meet MIL-STD-901D, MIL-STD-810F, MIL-STD-167, MIL-STD-461E, and MIL-STD-740
- Contains an intelligent fan controller (acoustically optimized, environmentally aware)
- Small-form factor chassis made of environmentally protected 5052 aluminum-alloy strain hardened and stabilized chassis
- Proven to function at an operating temperature of 0°-50°C

1U Server

The 1U server utilizes a small form-factor, 17-inch deep (short-rack) chassis.

1U Server Front and Rear Panel Components

Refer to Figure 1-1 and Table 1-1 for the typical 1U server front and rear panel components and connectors.

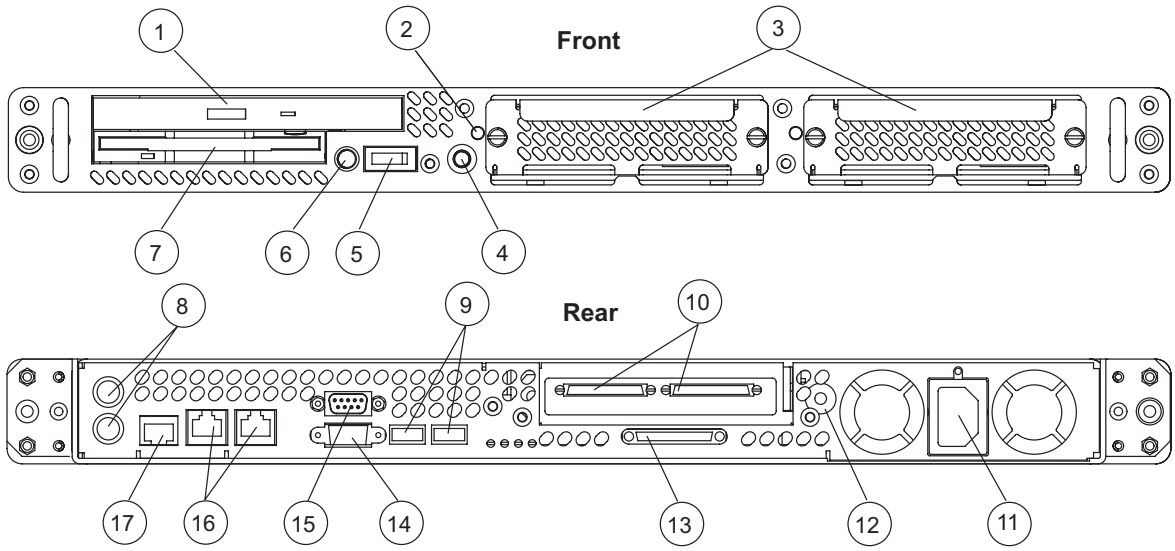


Figure 1-1: 1U Server Components and Connectors

Table 1-1: 1U Server Components and Connectors

No.	Description
1	CD/DVD ROM
2	Hard disk drive LED indicator
3	Hot-swap hard drive (2 places)
4	Reset switch
5	Power switch
6	Power LED
7	Floppy drive
8	Keyboard/mouse connector
9	USB connectors
10	Optional AGP/PCI card slot
11	AC power connector
12	Ground stud
13	SCSI connector *
14	Serial port connector
15	Video connector
16	NIC connector
17	Serial port connector

* Availability of this SCSI connector depends on the motherboard installed.

1U Server Internal Components

Refer to Figure 1-2 and Table 1-2 for a typical configuration of the 1U server internal components.

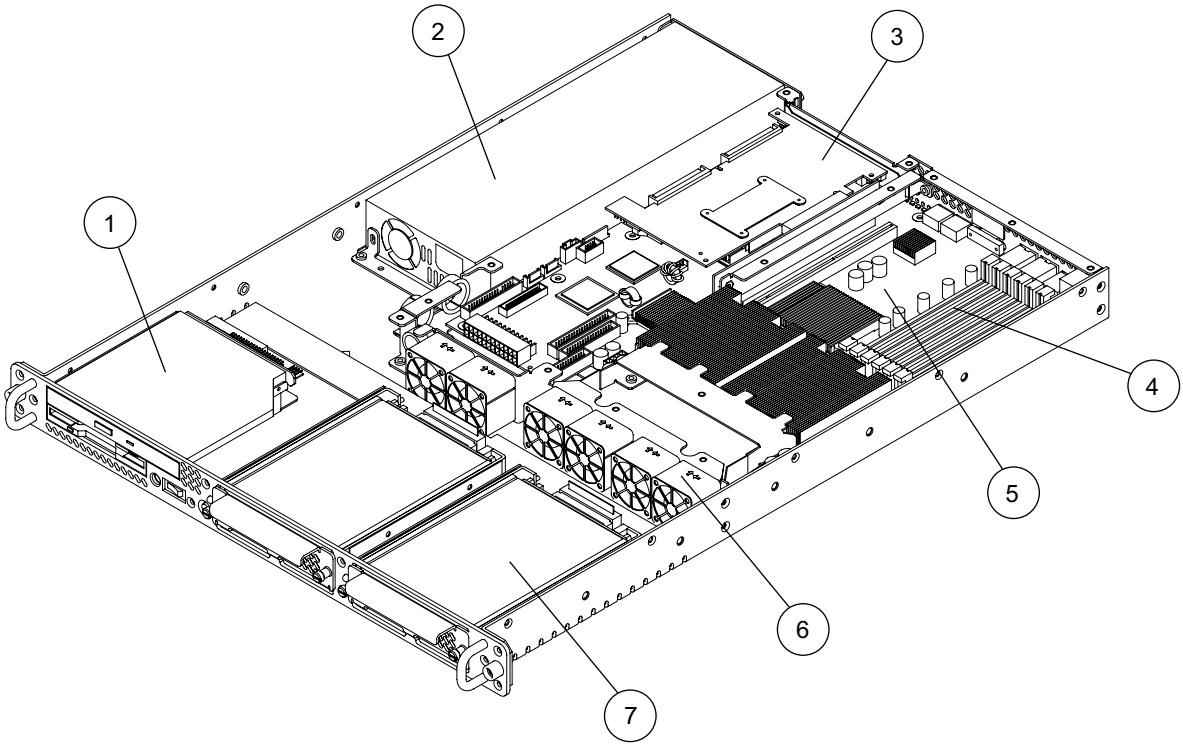


Figure 1-2: 1U Server Internal Components

Table 1-2: 1U Server Components and Connectors

No.	Description
1	CD/DVD ROM
2	Power supply
3	PCI card
4	Memory banks
5	Motherboard
6	Fan assembly
7	Hot-swap hard drive (2 places)

2U Server

The 2U server utilizes a small form-factor, 24-inch deep chassis with the storage capacity of up to 1.2TB (using SCSI hard drives).

2U Server Front and Rear Panel Components

Refer to Figure 1-3 and Table 1-3 for the typical 2U server front and rear panel components and connectors.

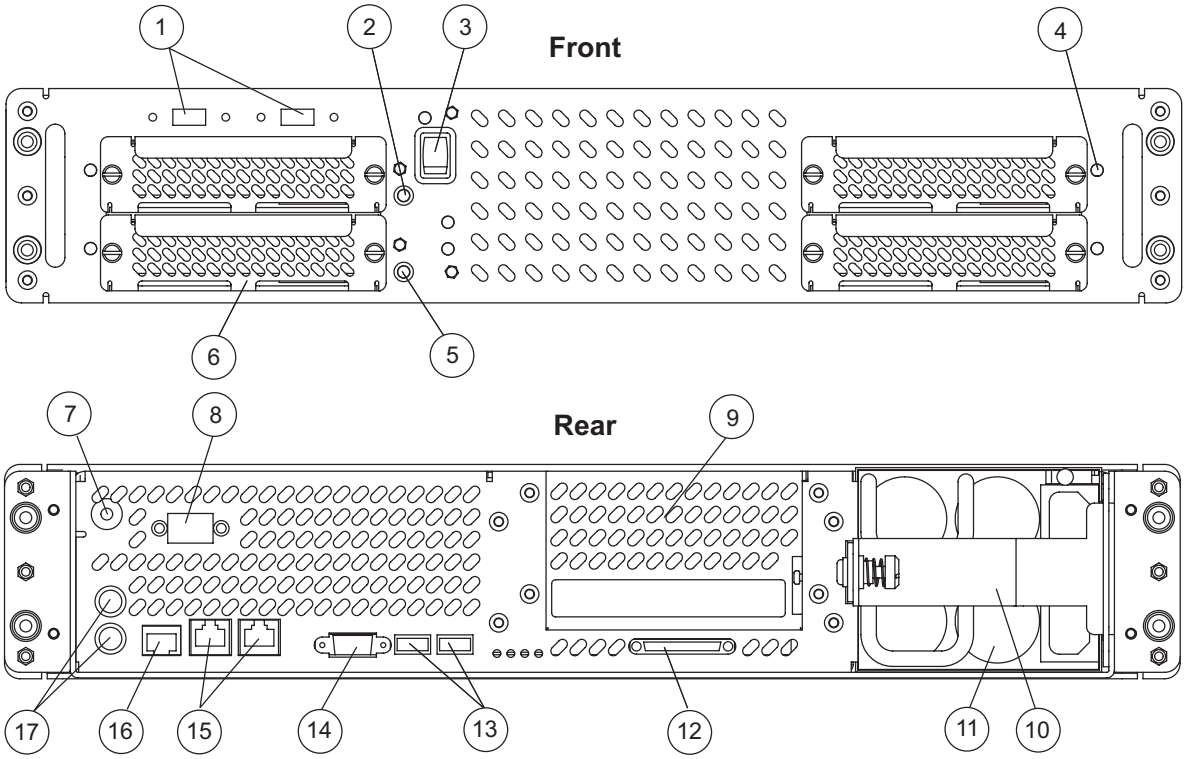


Figure 1-3: 2U Server Components and Connectors

Table 1-3: 2U Server Components and Connectors

No.	Description
1	USB connectors
2	Hot-swap power alarm
3	Power switch
4	Hard drive LED
5	Reset switch
6	Hot-swap hard disk drive (4 places)
7	Ground stud
8	Serial port connector
9	Slots for optional cards (3 PCI or 1 AGP)
10	Retention bracket

Table 1-3: 2U Server Components and Connectors (Continued)

No.	Description
11	Dual hot-swap power supply
12	Onboard SCSI connector (optional)
13	USB connectors
14	Video connector
15	Network Interface Card (NIC) connectors
16	Serial connector
17	Keyboard/mouse connector

2U Server Internal Components

Refer to Figure 1-4 and Table 1-4 for a typical configuration of the 2U server internal components.

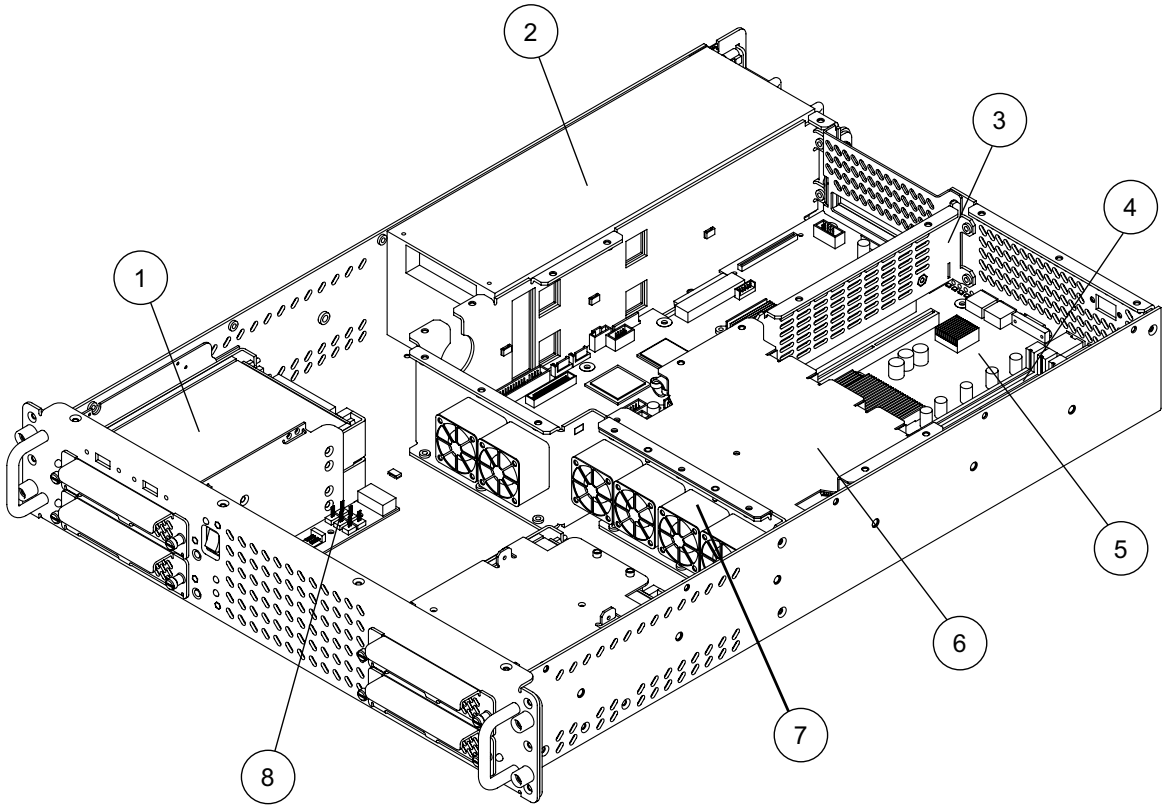


Figure 1-4: 2U Server Internal Components

Table 1-4: 2U Server Internal Components

No.	Description
1	Hot-swap hard drive (4 places)
2	Power supply
3	PCI riser bracket
4	Memory banks
5	Motherboard
6	Heat sink air duct system
7	Fan assemblies (6 places)
8	Fan controller board

4U Server

The 4U server utilizes a small form-factor, 16.5-inch deep chassis with specialized front-accessible fans that provide proper air flow and extreme cooling of the CPU.

4U Server Front and Rear Panel Components

Refer to Figure 1-5, Figure 1-6, and Table 1-5 for the typical 4U server front and rear panel components and connectors.

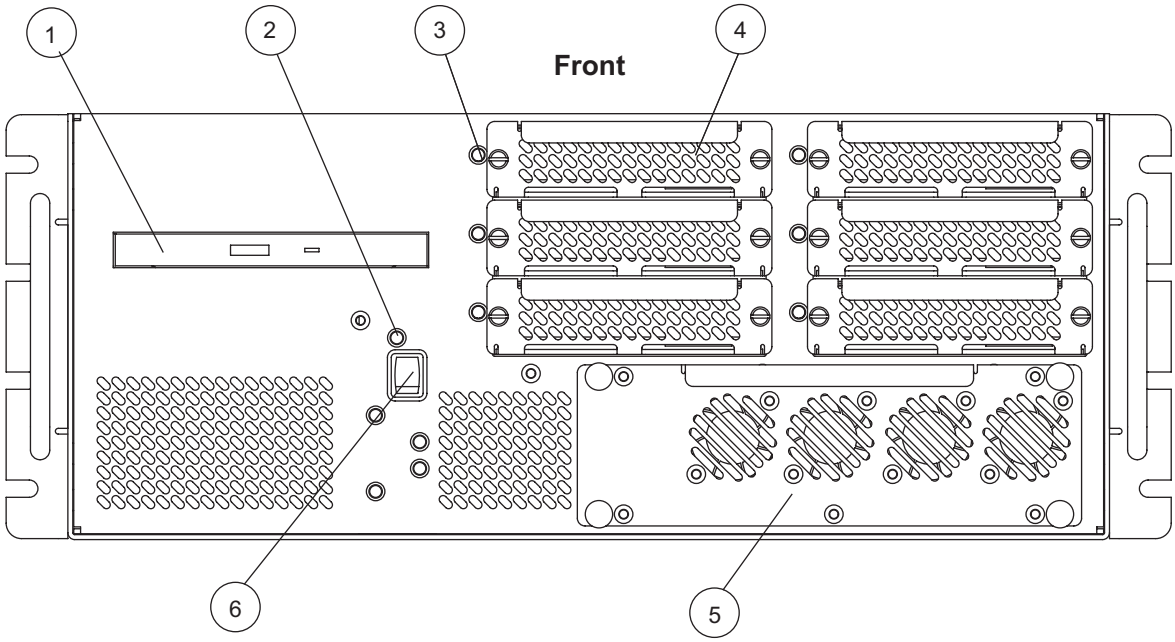


Figure 1-5: 4U Server Components and Connectors (Front View)

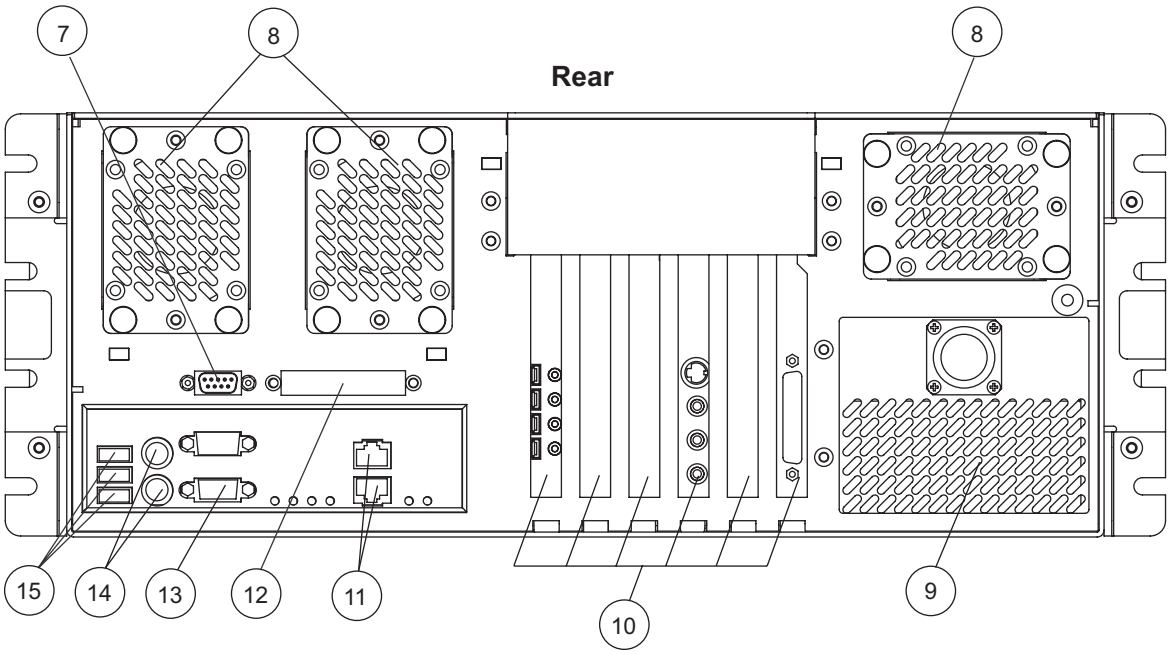


Figure 1-6: 4U Server Components and Connectors (Rear View)

Table 1-5: 4U Server Components and Connectors

No.	Description
1	CD/DVD ROM
2	Power alarm
3	Hard disk LED
4	Hot-swap hard drives (6 places)
5	Hot-swap fan module
6	Power switch
7	Serial port connector
8	Hot-swap fans (3 places)
9	Power supply
10	Optional PCI cards (6 places)
11	NIC connectors
12	Optional SCSI connector
13	Video connectors (2 places)
14	Keyboard / Mouse connectors
15	USB connectors

4U Server Internal Components

Refer to Figure 1-7 and Table 1-6 for a typical configuration of the 4U server internal components.

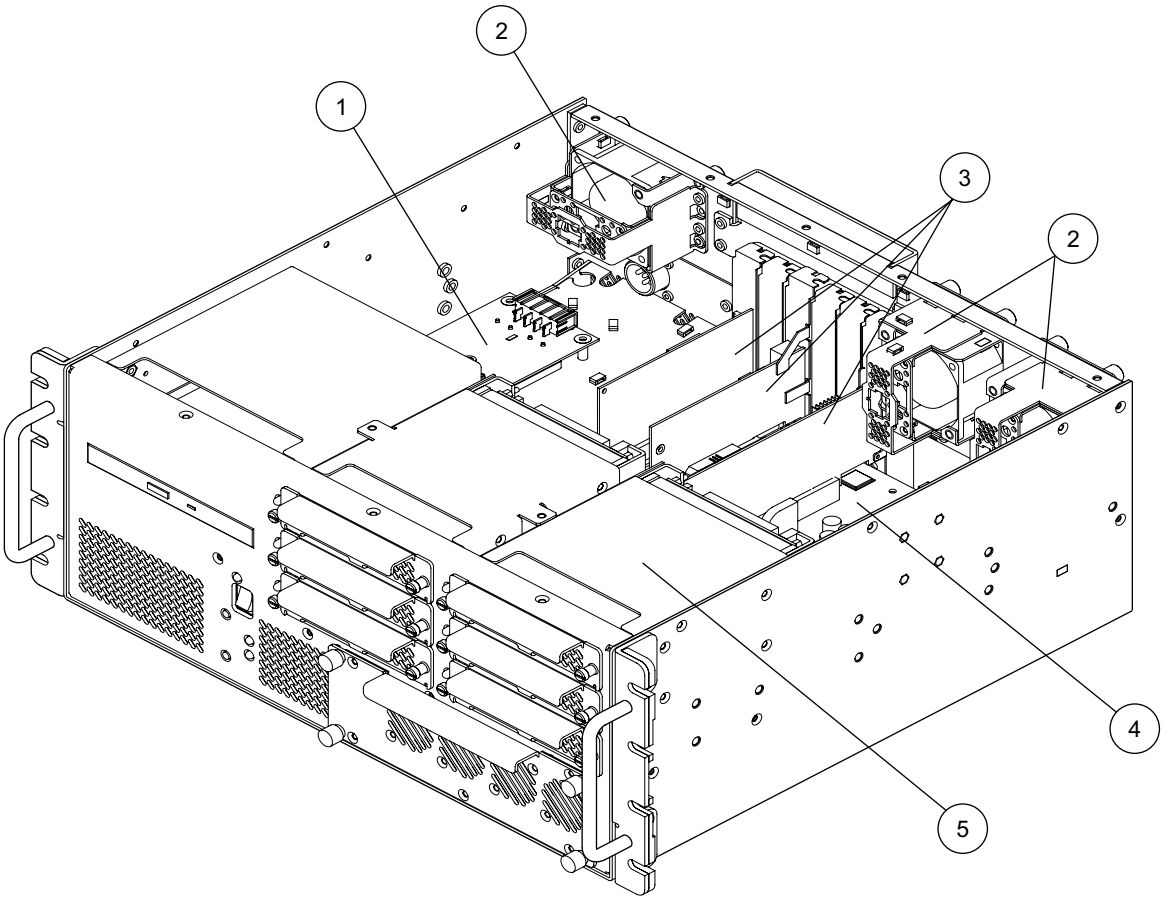


Figure 1-7: 4U Server Internal Components

Table 1-6: 4U Server Components and Connectors

No.	Description
1	Power filter boards
2	How-swap fans (3 places)
3	PCI cards (slots for 6 cards)
4	Motherboard
5	Hot-swap hard drives (6 places)

Chapter 2
Server Components

This chapter provides an overview of the most common components installed in TAG tactical servers. Information is also provided on how to identify specific components within your server. For detailed information on the specific components installed in your server, refer the manufactures website.

Identifying your Motherboard Model and Type

The version of an Intel server motherboard can be determined by decoding the last three digits of the board part number.

For example: C44686-703 The number following the “-” is as follows:

7 = Fabrication (FAB) Number

03 = Revision 3.

The board part number can be found on the motherboard. The board part number can also be determined by using Intel Server Management software.

Intel Motherboards

Figure 2-1 shows the primary components of the Intel SE7520JR2 motherboard. Table 2-1 lists these components. For detailed information on this and other Intel motherboards, refer to the Intel website at: **www.intel.com**.

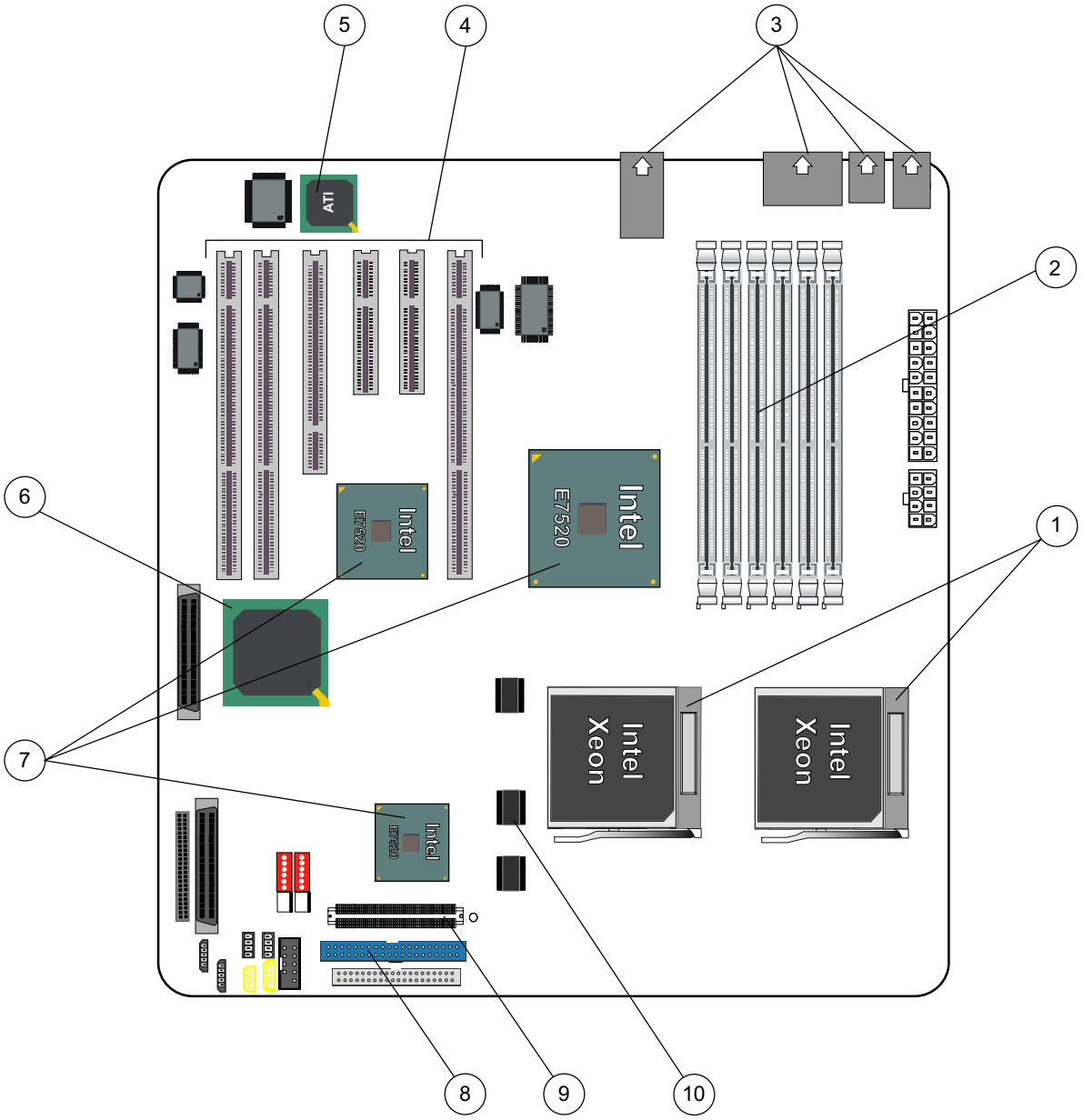


Figure 2-1: Intel SE7520JR2 Server Board

Table 2-1: SE7520JR2 Server Board Components

No.	Description
1	Support for two Intel Xeon processors with 800MHz system bus
2	Support for up to six DIMMs of Registered ECC DDR 266/333 or DDR2 400 SDRAM • Support for memory sparing and mirroring
3	Rear panel connectors. This includes: • Two Gigabit Ethernet connectors • PS/2 keyboard and mouse connectors • Three USB connectors • Video connector • Serial connector
4	Four independent PCI buses supporting PCI Express, PCI-X, and PCI, accessed through two riser slots: • Two adapter slots on a 1U system • Up to six adapter slots on a 2U system
5	Integrated graphics • ATI RAGE* XL SVGA PCI video controller with 8 MB of video memory
6	Optional integrated single- or dual-channel Ultra320 SCSI with support for RAID 0 and 1
7	Intel E7520 chipset
8	One IDE connector supporting two ATA 100 IDE channels
9	Intel Management Module upgrade connector • Support for Intel Management Module Professional Edition and Intel Management Module Advanced Edition (optional upgrades)
10	Intel Server Management 8 • Onboard Platform Instrumentation

System Memory

The type and amount of system memory, or RAM (random access memory), on your server depends on the motherboard installed and how it was configured. For example, the motherboard shown in Figure 2-1 on page 10 has six DIMMs (dual in-line memory modules), two per channel, and is capable of support up to 12 GB of system memory.

Identifying System Memory

Refer to *Identifying your Motherboard Model and Type* on page 9. Once you have identified the motherboard, TAG technical support can assist you in determining the type and amount of system memory in your system. See *Contacting TAG* on page vii for information on how to contact Technical Support.

For information on replacing or upgrading your system memory, refer to *Adding or Replacing System Memory* on page 34.

TAG Approved BIOS

The BIOS (basic input/output system) is the program stored on the CMOS that the server's microprocessor uses to get the system started after you turn it on. The BIOS also manages data flow between the computer's operating system and attached devices such as the hard disk, video adapter, keyboard, and mouse.

CAUTION

The BIOS installed on your server was loaded and tested with all the devices initially installed in your system. If you desire to have the BIOS updated, consult TAG technical support in advance as updates to your approved BIOS may cause your system to become unstable or inoperable.

Common BIOS Settings

The following sections discuss the various CMOS settings.

Printer Parallel Port-Uni., Bi-directional, Disable, Enable, ECP, EPP

Settings in the CMOS enable you to configure a parallel port to use Enhanced Parallel Port (EPP) or Enhanced Parallel Port (ECP). ECP. EPP and ECP are bi-directional standards, operate in 8-bit, and allow data transfer speed of approximately 2 MB/s. Some of the main differences are that ECP supports Direct Memory Access (DMA) and data compression, which enables higher transfer rates.

It is also possible to completely disable the parallel port in the BIOS. Most BIOS' allow you to set the DMA channel, when the port mode is set to ECP.

COM/Serial Port

Most personal computers have two serial ports. In the BIOS you can assign COM1/COM2/COM3/COM4 to serial port 1 or 2.

Most BIOS' also allow you to set the I/O and IRQ but this is mostly done automatically.

Floppy Drives

The floppy drive(s) can be enabled or disabled in the BIOS. The BIOS also allows you to choose the capacity of the media.

- 360 KB 5.25-inch
- 1.2 MB 5.25-inch
- 720 KB 3.5-inch
- 1.44 MB 3.5-inch
- 2.88 MB 3.5-inch

Some BIOS' allow you to swap A: and B: and disable seeking a floppy disk for a boot sector during startup.

Hard Drives

Most modern BIOS' allow automatic detection of disk parameters. The settings can be individually configured for the primary master and slave device and the secondary master and slave device. The following are some of the primary settings that apply to hard drives as well as CD/DVD-ROM drives, tape backup drive, etc.

- **Type**
  Common disk types are:
  - User-defined Cylinders, Heads, Sectors (CHS) values
  - Auto-automatically detects hard disks parameters at every startup
  - 1-46-predefined combinations of CHS values
  - CDROM-used for AT Attachment Packet Interface (ATAPI) CD-ROM drives
  - ARMD-used for ATAPI ZIP and LS 120 drives
  - DVDROM
- **Size**—Determines the capacity of the drive
- **CHS** values:
  - Number of Cylinders
  - Number of Heads
  - Number of Sectors
- **LBA** (Large Block Addressing)-technology to overcome the 528 MB limit.

Boot Sector Virus

A common setting related to hard drives. When enabled, the BIOS issues a warning message/beep if an attempt is made to write to the boot sector or partition table of a hard disk.

Memory

Parity adds an extra bit (odd or even) to the 8-bit data-string to ensure data integrity in memory modules. Its successor, ECC, provides improved data integrity by adding information about individual bits.

Boot Sequence

This setting is used to control the order that the BIOS uses during the boot process to look for a boot device from which to load the operating system. For example:

1. CD
2. Floppy
3. Hard Disk

Date and Time

The Date and Time is set in the BIOS, stored in CMOS, and maintained by CMOS battery.

Passwords

In most cases a user (startup) password and a supervisor (setup) password can be set in the CMOS. When a Setup password is required, the computer will prompt for it when you try to access the BIOS setup. When a Startup password is configured, the computer will prompt for it at every startup.

The CMOS password can be reset by shortening the “CMOS restore to factory defaults jumper” or by temporarily removing the CMOS battery.

Plug and Play BIOS

Today’s BIOS’ are Plug and Play (PnP)-aware. This means they are able to automatically assign resources such as IRQ and DMA to PnP devices.

Information about PnP devices is stored in a separate area of non-volatile CMOS memory, called the Extended System Configuration Database (ESCD). Both the PnP BIOS and the operating system can access this area and communicate with each other about resource settings assigned to PnP devices as well as non-PnP devices. For example, when a fixed interrupt request (IRQ) is manually assigned to a particular device using Device Manager, Windows will write this information to the ESCD on shutdown thereby preventing the BIOS from assigning the same IRQ to a PnP device at startup.

You can also reserve IRQs for non-PnP devices in the CMOS setup, this will prevent the BIOS from assigning these reserved resources to PnP devices, a common example is a legacy sound card that needs IRQ 5.

Power Management

Modern motherboards provide Advanced Configuration and Power Management Interface (ACPI) settings such as wake-up, power button function and standby/suspend timers. These functions are configured in the CMOS Setup.

Identifying your I/O Connectors

Figure 2-2 shows a typical configuration of I/O connectors. Your configuration may vary depending on the motherboard installed in your server; however, the color coding should remain

consistent. I/O connectors are color-coded in compliance with PC 99 recommendations. Table 2-2 lists the colors used.

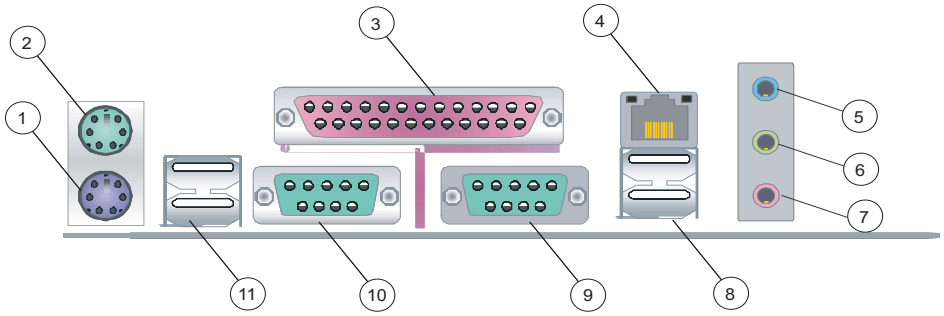


Figure 2-2: I/O Connectors Typical Configuration

Table 2-2: I/O Connector Color Codes

Item	Description	Color
1	PS/2 keyboard port	Purple
2	PS/2 mouse port	Green
3	Parallel port	Burgundy
4	Ethernet	Black
5	Audio line in (optional)	Light blue
6	Audio line out (optional)	Lime green
7	Microphone in (optional)	Pink
8	USB	Black
9	Serial port A	Teal
10	Serial port B	Teal
11	USB ports	Black

Standard Server Components

The following sections provide information on the standard system components installed on TAG servers.

Floppy Drives

The floppy disk drive is a removable storage component and part of the storage subsystem. Currently TAG uses three styles of floppy disk drives. The drive style installed in your system depends upon the system configuration and motherboard.

The most common is the low-profile (or micro), internally mounted 1.44MB floppy drive as shown in Figure 2-3.

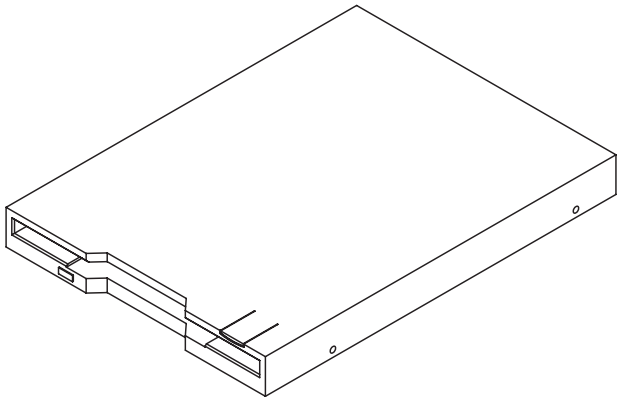


Figure 2-3: Low-profile 1.44MB Floppy Disk Drive

Another popular configuration is the standard size or half-height floppy disk drive as shown in Figure 2-4.

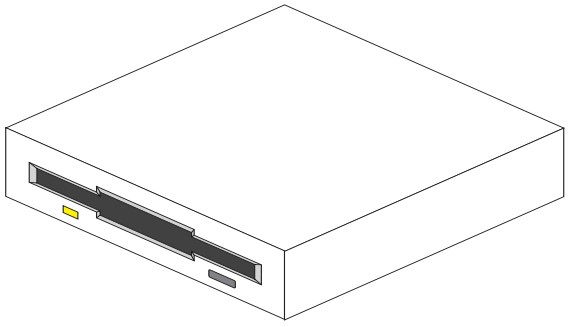


Figure 2-4: Standard 1.44MB Floppy Disk Drive

Some of our Tactical Hybrid Servers use the external Universal Serial Bus (USB) floppy disk drive as shown in Figure 2-5. The USB interface takes advantage of today's operating systems

ability to detect dynamically installed devices and to avoid device interrupt conflicts with other applications and devices.

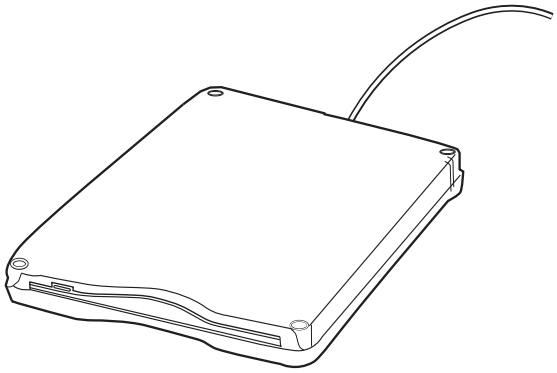


Figure 2-5: USB 1.44MB Floppy Disk Drive

Tape Drive

The tape drive (Figure 2-6) is a removable storage component and part of the storage subsystem. Tape backup provides the ability to periodically copy the contents of all or a designated amount of data from its usual storage device to a tape cartridge device. Tape backup can be done manually or with appropriate software, can be programmed to run automatically.

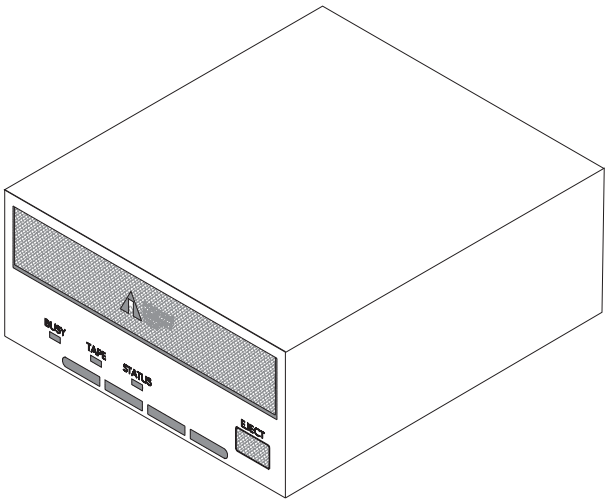


Figure 2-6: Tape Drive

Optical Drives

The type of optical drive installed in your server varies per configuration. Figure 2-7 show an example of a CD-ROM drive. TAG server typically come with CD-ROM (Compact Disk-Read Only Memory). CD-ROM drives are generally used to install

software. CD-RW (Compact Disk-Re-writable) drives can be used to store and backup data.

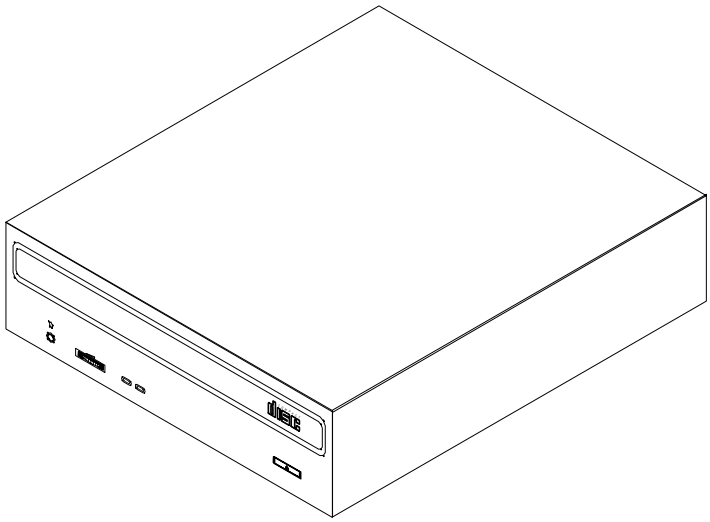


Figure 2-7: Optical Drive

Power Supply

TAG offers many power supplies; each TAG server is matched with a power supply to provide the correct load to all devices while keeping heat within the system to a minimum.

Note: Functional system operation as well as component life can be seriously degraded by excessive heat within your system.

⚠ WARNING

Power supplies contain dangerous voltages. Before attempting to work on any power supply always unplug the device and drain the power source by turning the server on after the power supply has been disconnected. Failure to follow these instructions could result in serious injury due to electrical shock.

Standard Non-hot-swap Power Supply

The typical TAG non-hot-swap power supply is a load-balancing, auto-switching power supply. Figure 2-8 shows a standard 1U power supply. As with all TAG power supplies, it is designed to provide the correct load to all devices, while not supplying excessive heat within the system.

The power supply is secured in place with specially designed brackets and secured with chemically coated screws to protect your system from damage due to shock and vibration.

Field service of these power supplies is not recommended. Contact TAG Technical Support at **tech.support@tag.com** to arrange to have the power supply serviced in your server.

Detailed troubleshooting procedures, and frequently asked questions (FAQs) can also be found on the TAG Website (**www.tag.com**). For more information, see *Contacting TAG* on page vii.

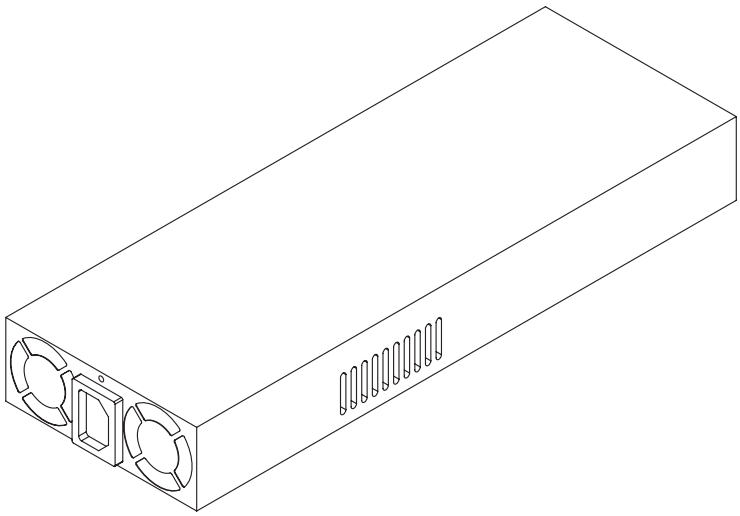


Figure 2-8: Standard 1U Power Supply

Hot-swap Power Supply

To satisfy reliability requirements, TAG servers are designed with hot-swappable power supplies. If in the event of a power supply module failure or if the power source fails and only one module is receiving power, an audible alarm sounds. For procedures on how to hot-swap a power supply module refer to *Replacing a Hot-swap Power Supply Module* on page 32.

Identifying the Power Supply Manufacturer and Model

Although most TAG power supplies for the 1U and 4U series servers are similar in physical sizes, and physical characteristics, some servers use smaller foot print power supplies. Figure 2-9 shows a typical 4U hot-swap power supply.

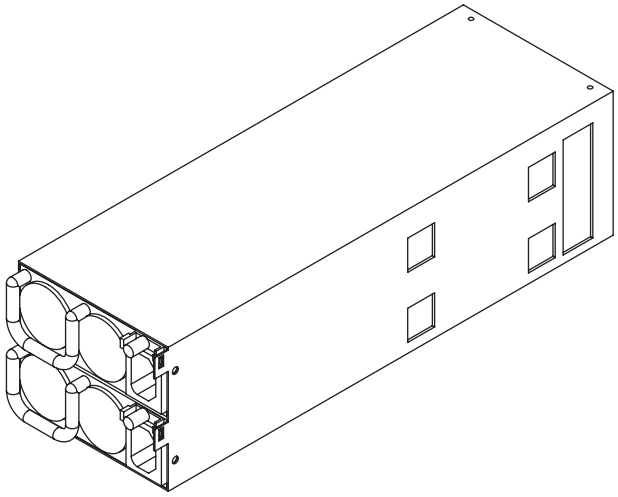


Figure 2-9: 4U Hot-swap Power Supply

If your server has two power input receptacles, then the server is equipped with a redundant hot-swap power supply.

Silencing the Audible Alarm

To silence the audible alarm and determine its cause, do the following:

- Press the Silence Alarm symbol (Figure 2-10) on the server front panel.

Figure 2-10: Silence Alarm Symbol

To determine the cause of the alarm:

- Verify that the power cable is plugged into the power source.
- Verify that the power supply module has not be removed or unplugged.

Detailed troubleshooting procedures, and frequently asked questions (FAQs) can also be found on the TAG Website (**www.tag.com**). For more information, see *Contacting TAG* on page vii.

Additional Optional Components

The following sections provides on overview of the optional components that may be included with your server. For detailed information on these components, refer to the manufactures website or contact TAG Technical Support at **tech.support@tag.com**. For more information, see *Contacting TAG* on page vii.

Serial Interface Cards

The 7201 Peripheral Component Interconnect (PCI) serial interface provides two serial ports, each individually configurable for RS-232, RS-422, or RS-485. The board is capable of data rates to 460.8K bps and automatically handles RS-485 transmitter enable/disable. The 7201 utilizes 16C550 Universal Asynchronous Receiver-Transmitters (UARTs) that provide 16-byte Tx/Rx first-in, first-outs (FIFO). Ordering options allow the choice of UARTs with larger FIFOs, support for custom baud rates, and 9-bit protocols.

PC-based Card Readers

PC card readers extend a computer system's capabilities by providing universal access to the LYNKS Hardware Secure Modules (HSM) and Fortezza Crypto Card.

Functions:

- Secure Messaging: e-mail, workflow, and EDI
- Electronic Wallets: Digital cash and electronic checks
- Strong Authentication: Positively verify user's identity
- Electronic Commerce: Conducted over the Internet using Visa®/MasterCard® SET™
- Fraud Detection: Detect changes to paper and electronic documents
- Electronic Notary: Digitally sign and time stamp legal documents
- Secure Storage: Secure on-card storage is tamper proof
- Secure Content Delivery: CD-ROM, set-top boxes

Time Sync Cards

The TPRO-PCI performs timing and synchronization functions referenced to an input time code signal. The board synchronizes its on-board clock to the incoming time code. The on-board clock's time is also provided as an IRIG-B output. Other features include a time-tag TTL input, a programmable "heartbeat" pulse or squarewave output (with interrupt capability), and a programmable "match" start/stop time output (with interrupt capability).

DDC Dual Channel MIL-STD 1553 Cards

The BU-65569iX is a single-channel or multi-channel MIL-STD-1553 PCI card. The BU-65569iX includes one to four dual redundant 1553 channels. The design of the BU-65569iX leverages the Enhanced Mini-ACE. Each channel may be independently programmed for BC/RT/Monitor, or RT/Monitor mode.

Video Capture Cards

The Osprey-100 captures full frame video at 30 frames per second and allows for Windows Media encoding along with capture into other popular software packages.

Identifying Server Components using Device Manager

The Device Manager is one of Windows' most useful diagnostic tools. It lets you see all of the devices attached to your computer, and which resources they are each using. To access the Device Manager do the following:

1. Click **Start**, point to **Settings**, and then click **Control Panel**.
   Result: The Control Panel appears (Figure 2-11).

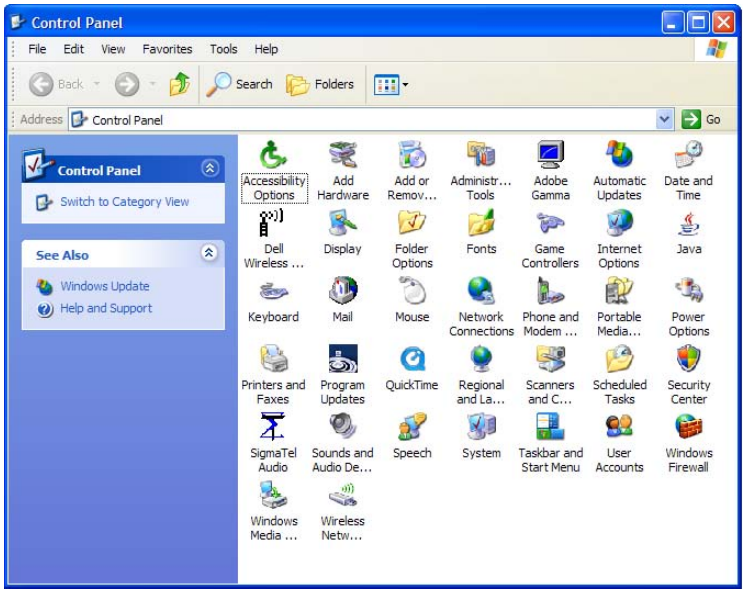


Figure 2-11: Control Panel

2. Double-click the **System** icon.
   Result: The System Properties dialog box appears (Figure 2-12).

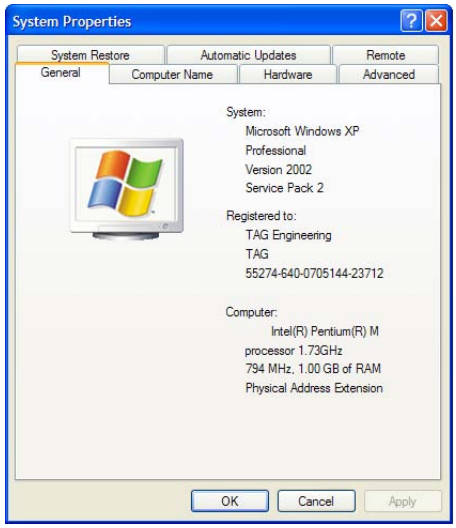


Figure 2-12: System Properties Dialog Box

3. Click the **Hardware** tab, and then click the **Device Manager** button.
   Result: The Device Manager appears displaying a list of your hardware devices organized by type (Figure 2-13).

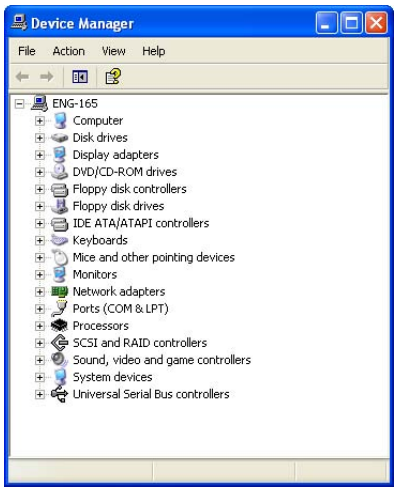


Figure 2-13: Device Manager Dialog Box

After opening Device Manager, you will see a list of all the devices Windows detected on your system. The Device Manager display is recreated each time the computer is started, or whenever a dynamic change to the computer configuration occurs, such as addition of a new device while the system is running.

Note: To include hidden devices, on the **View** menu, click **Show hidden devices**. A check mark next to **Show hidden devices** indicates hidden devices are showing. Click it again to clear the check mark. Hidden devices include non-PnP devices and devices that have been physically removed from the computer but have not had their drivers uninstalled

The devices shown represent the computer's current hardware configuration information. Any non-functioning devices are displayed with an exclamation point, indicating that a problem exists with the device; disabled devices are displayed with a small red “x” over the icon.

You can use Device Manager to enable or disable devices, troubleshoot devices, update drivers, use driver rollback, and change resources such as interrupt requests (IRQs) assigned to devices.

Working with Device Properties

To display a device’s properties do the following:

1. Access the Device Manager as describe in steps 1 through 3 of *Identifying Server Components using Device Manager* on page 22.
   Result: The Device Manager appears displaying a list of your hardware devices organized by type (Figure 2-14).

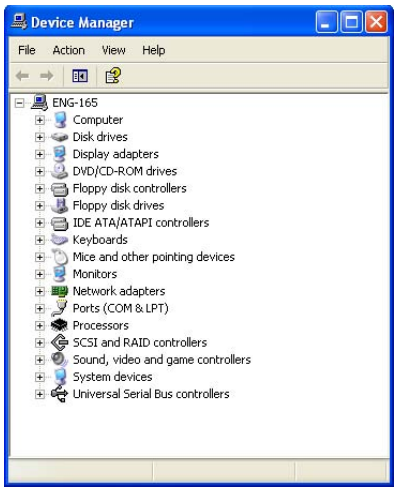


Figure 2-14: Device Manager Dialog Box

2. In the Device manager dialog box (Figure 2-13), double-click the device, or select the device and then click the **Properties** toolbar button.
   Result: The Properties dialog box for the selected device appears (Figure 2-15)..

Figure 2-15: Properties Dialog Box

In the device's Properties dialog box, there might be several tabs. You can view the status and configuration information, as well as the device manufacturer, device type, and location in the upper portion of the General tab.

The Device status box in the middle of the General tab displays the status of the device, including any errors. If the device has any problems, the Device Status box briefly describes the problem, and usually describes the appropriate course of action to correct the problem. Click **Troubleshoot...** to use the built-in mechanisms for detecting the nature of the problem.

Other tabs include the Driver tab, which displays the details of the driver being used. This tab also lets you update or uninstall the driver. The Resources tab displays the hardware resources being used. This tab allows you to see and resolve any conflicts caused by non-PnP devices. Along with these tabs, some devices have additional advanced settings or tabs for device-specific settings.

Installing and Removing Hardware in Windows

Plug and Play (PnP) is a standard that makes installing new hardware devices easier. Prior to PnP, installing new hardware meant finding and installing peripheral drivers and making sure the new device didn't conflict with another device. Theoretically, if you have a computer designed for PnP and are using a PnP operating system (like Windows), installing a printer, sound card, modem, or other peripheral is a simple matter of plugging in the device.

It's not always quite this simple. Assuming you are using a PnP computer, when you attach a PnP device, you may see a message indicating that Windows has recognized the new device-either immediately or the next time you start up your system. If Windows needs a driver that is not currently installed, you may at that point be asked to insert a disk or the Windows CD-ROM. If you don't see a message but the device appears to be working, you can assume that everything is fine.

Using the Add New Hardware Wizard

If the device is not working properly, try using the Add New Hardware Wizard. To run this wizard do the following:

1. From the **Start** menu, point to **Settings** and then click **Control Panel**.
   Result: The Control Panel dialog box appears (Figure 2-16).

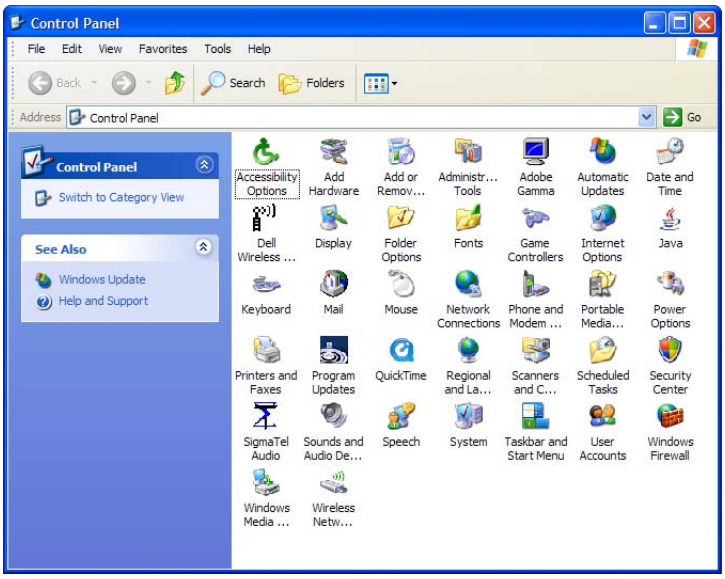


Figure 2-16: Control Panel

2. Double-click the **Add Hardware** icon.
   Result: The Add Hardware Wizard dialog box appears (Figure 2-17).

Add Hardware Wizard
Welcome to the Add Hardware Wizard
This wizard helps you:
• Install software to support the hardware you add to your computer.
• Troubleshoot problems you may be having with your hardware.
If your hardware came with an installation CD, it is recommended that you click Cancel to close this wizard and use the manufacturer's CD to install this hardware.
To continue, click Next.
< Back
Next >
Cancel

Figure 2-17: Add Hardware Wizard

3. Follow the on-screen instructions.

Installing Legacy Peripherals

When you install what Microsoft calls a legacy peripheral, you will need to use the Add Hardware Wizard, as described *Using the Add New Hardware Wizard* on page 26, to let Windows know about the new device.

Note: The term legacy refers to anything that's no longer on the cutting edge.

Removing Legacy Peripherals

When removing a legacy peripheral from your system, you need to let Windows know that the device is gone. This enables Windows to reuse the resources (places in memory and internal communications channels) that it previously allocated to that device.

To tell Windows that you have removed a legacy device, perform the following steps:

1. From the **Start** menu, point to **Settings** and then click **Control Panel**.

Result: The Control Panel appears (Figure 2-18).

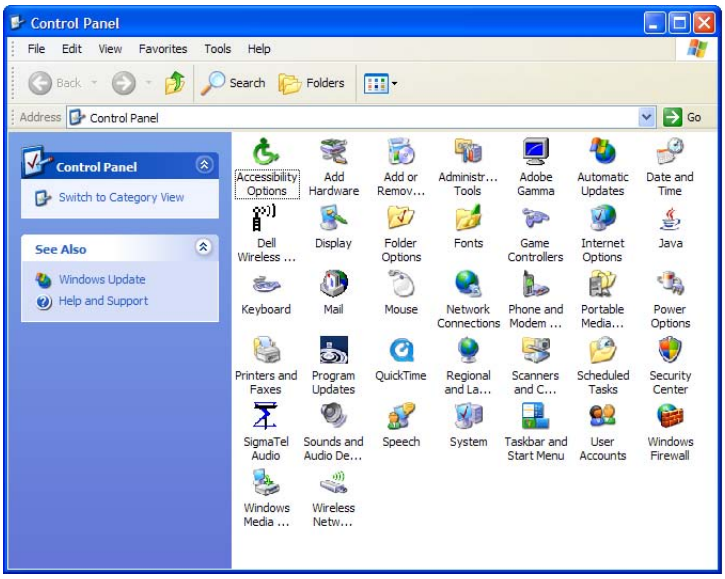


Figure 2-18: Control Panel

2. Double-click the **System** icon.
   Result: The System Properties dialog box appears (Figure 2-19).

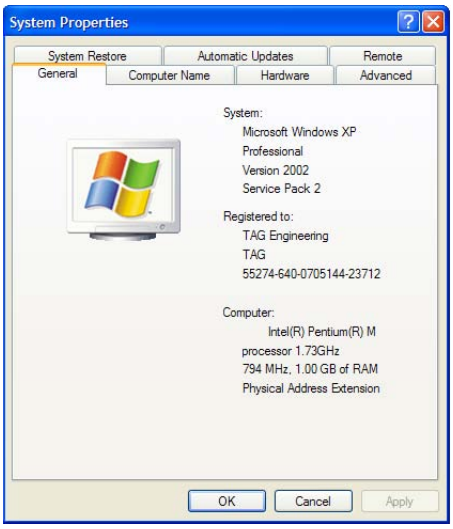


Figure 2-19: System Properties Dialog Box

3. Click the **Hardware** tab.
4. Click the **Device Manager** button.
   Result: The Device Manager appears displaying a list of your hardware devices organized by type (Figure 2-20).

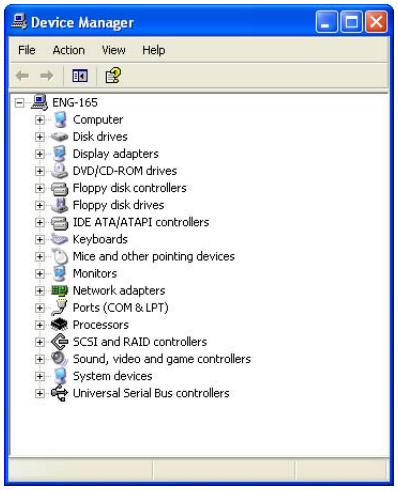


Figure 2-20: Device Manager Dialog Box

5. Click the name of the item you have removed from your system.
   If you don't see the item, look for a category heading that describes the type of device you removed, and then click the plus sign to its left to display a list of items in that category.
6. From the **Action** menu, click **Uninstall**.
   Result: The system asks you to confirm the removal.
7. Click **OK**.

Chapter 3
Upgrading Memory and Replacing Hot-swap Components

This chapter provides procedures for replacing hot-swappable components as well as procedures for replacing or adding system memory.

Preventing Static Electricity

The components inside your computer are extremely sensitive to static electricity, also known as electrostatic discharge (ESD). ESD can permanently damage electrostatic discharge-sensitive components in your server.

To prevent ESD damage, follow these guidelines before opening the server case:

- Turn off the server and unplug the power cord before opening the case.
- Wear a grounding wrist strap and attach it to a bare metal part of the server, workbench, or other grounded connection (Figure 3-1).

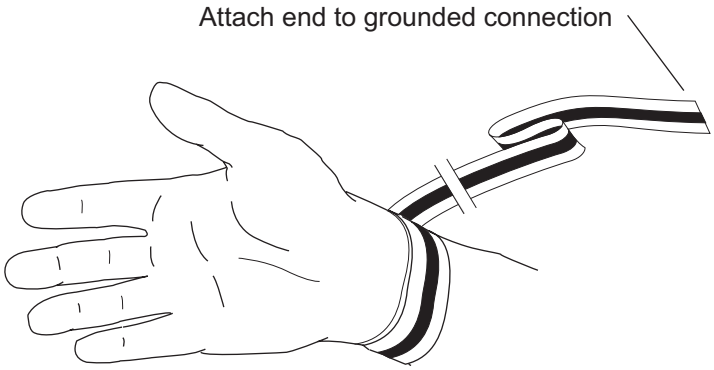


Figure 3-1: Attaching a Static Wrist Strap

- Do not insert any object into the vent holes on the case or the power supply.
- Touch a bare metal surface on the back of the computer, a bare metal surface on your workbench, or other grounded object before handing DIMMs or other components.

Before working with computer components, follow these guidelines:

- Avoid static-causing surfaces such as carpeted floors, plastic, and packing foam.
- Remove components from their antistatic bags only when you are ready to use them. Do not lay components on the outside of antistatic bags because only the inside of the bags provide electrostatic protection.
- Always hold memory modules and components by their edges or their metal mounting brackets. Avoid touching the edge connectors and components on the cards. Never slide memory modules or components over any surface.

Replacing a Hot-swap Power Supply Module

Your TAG server was designed with the ability to hot-swap a power supply module without disconnecting system power. Refer to Figure 3-2 and the steps that follow to hot-swap a power supply module.

Note: If you need to remove both modules, you must shutdown the system, unplug the power source from the unit and drain the systems onboard battery by pressing the on/off switch and holding it in place for approximately 10 seconds to drain any charge that might be retained by the systems motherboard.

1. Obtain certified replacement module from TAG. For more information, see *Contacting TAG* on page vii.
2. Depending on the series of your server, either a retention bracket or filtering cover that is secured with thumb screws will need to be removed first.

Note: In some cases a screw driver (Philips head) might be required to remove a retention bar that is screwed into the power supply.

3. Loosen the thumb screws on the desired module to be replaced.

4. Depress the module safety latch and gently pull the handle as shown in Figure 3-2.

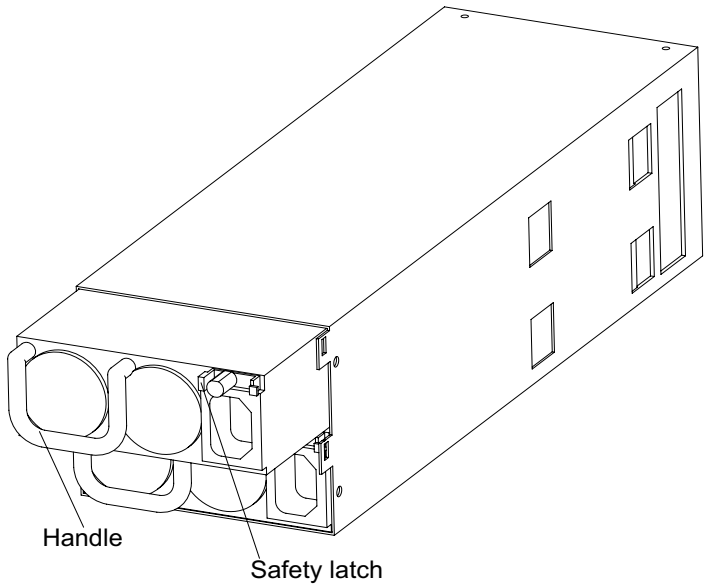


Figure 3-2: Hot-swap of 4U Server Power Supply Module

5. Slide the replacement module into the power supply. Press firmly and evenly on the power module until you feel the module seat in the back of the power supply.

Replacing a Hot-swap Hard Drive

The system's hard drive hot-swap feature enables you to remove a hard drive without shutting down the operating system or turning off the system power. The way in which you remove a hard drive depends on the application you are using and whether you are replacing a drive, adding a new one, or removing a drive permanently.

When you remove a drive using the hot-swap operation, you need to stop the hard drive and take it offline to remove the logical software links to the hard drive, and to reconfigure the file system so that it will now ignore the removed drive. You might also have to reconfigure your application software to operate without the removed drive. Therefore it is *strongly* recommended that you contact TAG Technical Support at **tech.support@tag.com** before attempting to hot-swap a hard drive. For more information, see *Contacting TAG* on page vii.

Removing the Server Cover

The location of the mounting screws securing the server cover varies per server model. To remove the cover, use a Phillips screwdriver to remove all screws from the sides and top of the cover.

Note: It is important to make note the location from which screws are removed since different screw lengths may be used to secure the cover.

⚠ CAUTION

It is not safe to operate TAG servers without the cover in place. Failure to take this precaution may result in personal injury and system damage.

Adding or Replacing System Memory

This section lists the procedures for adding or replacing system memory.

⚠ WARNING

Ensure that the system is powered-down and all power sources have been disconnected from the server prior to removing or replacing system memory. Failure to do so could result in serious injury from electrical shock.

⚠ CAUTION

Printed circuit boards and hard drives contain electronic components that are extremely sensitive to static electricity. Ordinary amounts of static from your clothes or the work environment can destroy components. Do not touch the components or any metal parts without taking proper antistatic precautions.

When installing or adding memory (Figure 3-3), a minimum of two identical 128MB modules are required. Dual In-line Memory Module (DIMMS) must be installed in pairs and must be populated starting with DIMM Bank 1. For example, you can

install two 128MB DIMMS in Bank 1 and two 256MB DIMMS in Bank 2.

Note: Although the server board architecture allows you to mix various sizes of DIMMS between banks, DIMMS must be identical within each bank.

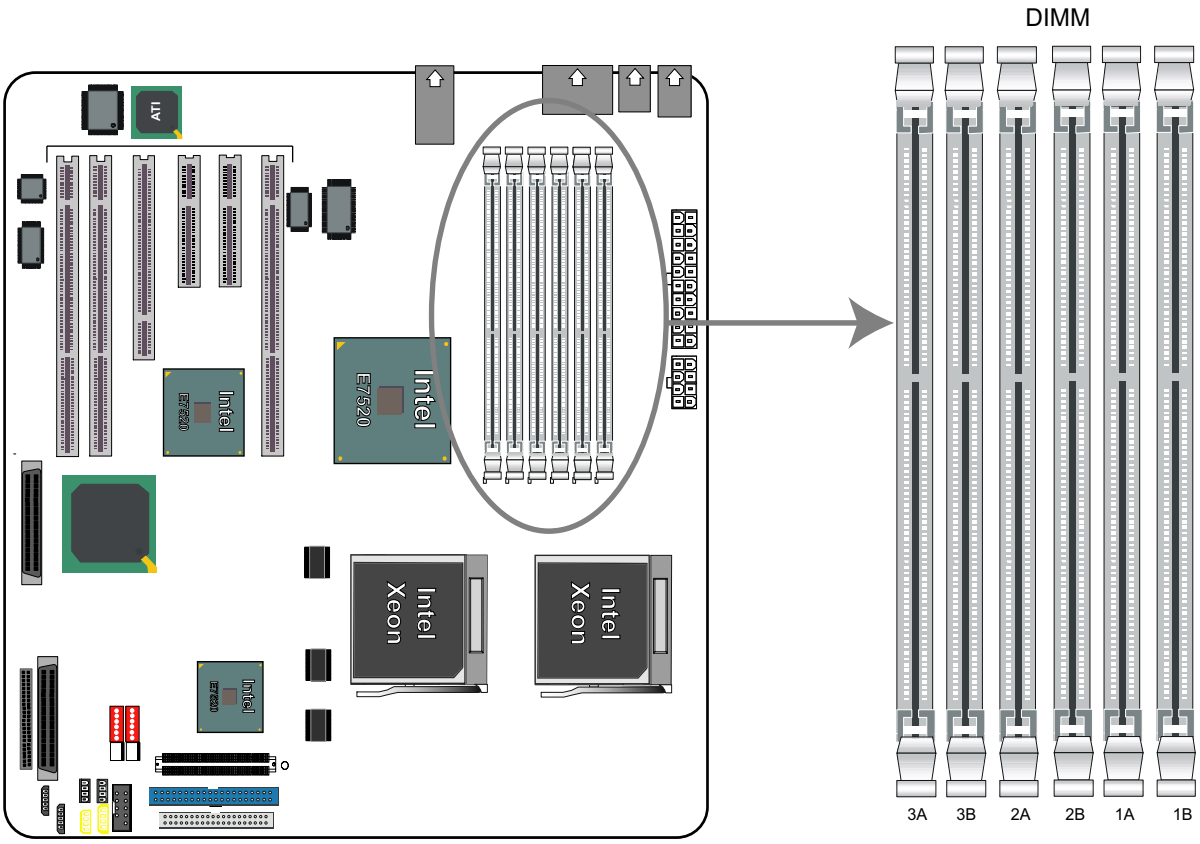


Figure 3-3: System Memory

To install system memory, do the following:

1. Unlatch both DIMM socket levers, as shown in Figure 3-4.

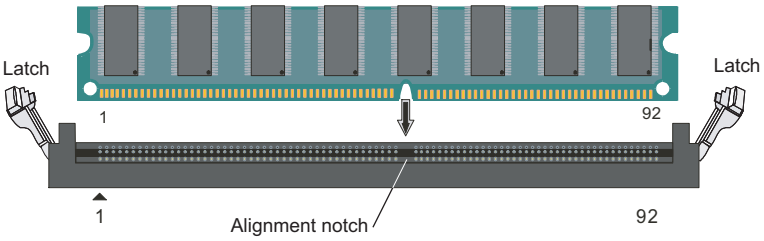


Figure 3-4: DIMM Module Bank

2. Note the location of the alignment notch.
3. Align the notches on the new module with the notches on the memory and press it firmly into the bank.

Note: The tabs on the sides of the memory module should secure the DIMM automatically. When the DIMM locks into place, you hear a click.

Chapter 4
RAIDs

RAID is an acronym for Redundant Array of Inexpensive (or Independent) Disks. This section provides a high-level overview that defines RAID, the advantages and disadvantages of various RAID levels, and guidelines to observe when implementing RAID.

RAID Defined

RAID is a way of storing data on two or more physical disks for the purpose of redundancy, improved performance, or both. The combined physical disks make up what is called an array. This array appears on the host system as one disk. For example, if you have physical disk 1 and physical disk 2, those two disks appear to the host system as one disk.

RAID consists of different levels, which determine how the data is placed in the array. Each RAID level has specific data protection and system performance characteristics. The following are commonly used SCSI RAID levels:

- **RAID Level 0**: Striping, good performance, no redundancy
- **RAID Level 1**: Mirroring, one-to-one redundancy
- **RAID Level 5**: Striping with parity striped across all drives; offers performance and redundancy
- **RAID Level 10**: Mirroring and striping; best redundancy and best performance
- **RAID Level 50**: Parity striped across all drives in a mirrored set; redundancy and performance

You can manage RAID arrays with a RAID controller (hardware RAID) or with software alone (software RAID).

Reasons for RAID

Depending on how you implement RAID (which RAID level you use), the benefits include one or both of the following:

- **Faster performance**: In RAID 0, 10, or 50 arrays, the host system can access multiple disks simultaneously. This improves performance because each disk in an array has to handle only part of the request. For example, in a two-disk array, each disk needs to provide only its part of the requested data.

- **Data protection**: In RAID 1, 10, 5, and 50 arrays, the data is backed up either on an identical disk (mirror) or on multiple disks (parity disks). RAID 10 and 50 also allow the host to access disks simultaneously.

RAID Level 0

RAID Level 0 is not redundant, hence does not truly fit the "RAID" acronym. In Level 0, data is split across drives, resulting in higher data throughput. Since no redundant information is stored, performance is very good, but the failure of any disk in the array results in all data loss. This level is commonly referred to as striping.

RAID Level 1

See Figure 4-1. RAID Level 1 is commonly referred to as mirroring with 2 hard drives. It provides redundancy by duplicating all data from one drive on another drive. The performance of a Level 1 array is slightly better than a single drive, but if either drive fails, no data is lost. This is a good entry-level redundant system, since only two drives are required. However, since one drive is used to store a duplicate of the data, the cost per megabyte is high.

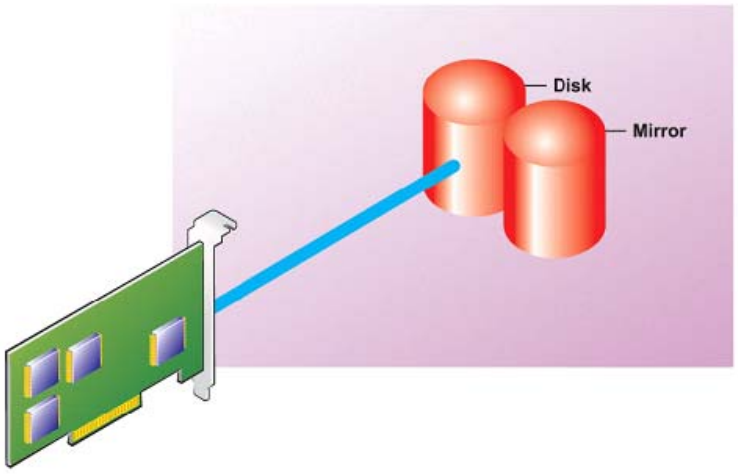


Figure 4-1: RAID Level 1 (Mirroring)

RAID Level 5

RAID Level 5 maps the data across the drives and stores parity information for each data stripe on different drives in the array. The parity data, labeled P in Figure 4-2, is distributed. This lessens the data congestion that occurs if all of the parity data is

written to one drive. A RAID 5 array can preserve data if one drive fails. However, if two drives fail, all data in the array is lost.

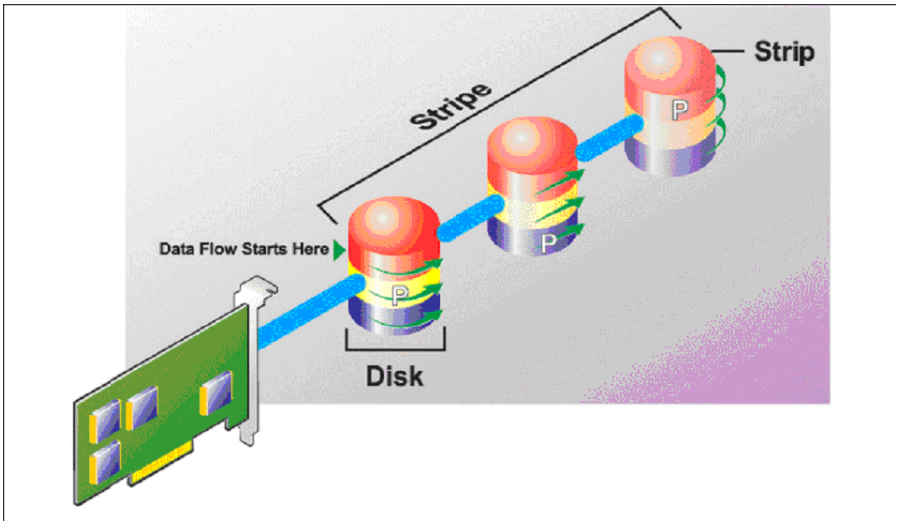


Figure 4-2: RAID Level 5

RAID 50

See Figure 4-3. RAID Level 50, is a variation of RAID Level 5 that maps data across two Level 5 arrays. Level 50 offers the data protection of Level 5 and, depending on the size of the data stripes (established when you configure the array), can provide fast throughput.

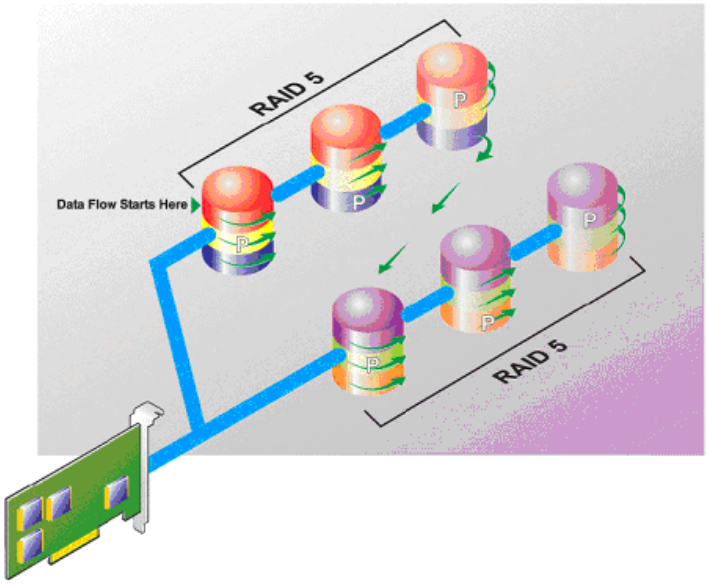


Figure 4-3: RAID Level 50

About RAID Global and Hot Spares

A hot spare is a drive that is on standby in case another drive fails. Depending on how the array is configured, the drive is either picked up automatically and the array is rebuilt, or you manually select the drive (or insert a new drive in the same slot as the failed drive) and rebuild the array.

How the hot spare works depends on how the array is configured. When a drive fails, the array rebuilds automatically using the hot spare. This is assuming that automatic rebuild is enabled If automatic rebuild is disabled, you must manually start the rebuild process.

During a rebuild you may notice degraded performance on the drives.

Global and Dedicated Hot Spares

A dedicated hot spare is assigned to one or more arrays, whereas a global hot spare can be used for any array that is on the same controller as the hot spare. Also, dedicated hot spares that reside in the same storage enclosure typically have better performance than global hot spares.

Chapter 5
Monitors and Keyboards

This chapter provides an overview of ruggedized, rack-mounted monitors, keyboards, and monitor/keyboard combinations manufactured by TAG. Procedures are provided on how to adjust monitor display settings.

Figure 5-1shows the 1U RLKM-15 LCD/Keyboard.

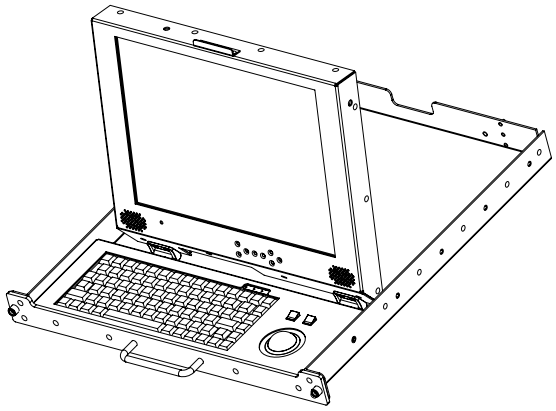


Figure 5-1: RLKM-15 LCD/Keyboard

Keyboards

All TAG keyboards drawers come in a 1U configuration. The following lists the key features of each model. For additional information, refer to the TAG Website (**www.tag.com**).

- RKM
  - 121 Key PS/2 keyboard with integrated scratchpad
  - Integrated wrist pad in front of keyboard
  - Integrated retractable cable management system (cables can be mounted on either side of the drawer)
  - Locking side rails
- RKT
  - MIL-STD 121 Key PS/2 Waterproof keyboard
  - Integrated 1.5-inch trackball with three built-in mouse buttons
  - Integrated wrist pad in front of keyboard
  - Integrated retractable cable management system
  - 24-inch locking side rails

- Optional USB rugged, waterproof keyboard

LCD Monitors

TAG LCD Monitors come in 1U, 18-inch and 2U, duel 18-inch configurations. The following lists the key features of each model. For additional information, refer to the TAG Website (**www.tag.com**).

- RL-18
  - Locking, rack-mount slide rails
  - Resolution: 1280 x 1024
  - Refresh Rate: Up to 85Hz
  - White Luminance: 235 cd/m2
  - Support Color: 16M
  - Folding 18-inch active matrix LCD
  - Constant torque LCD monitor hinges
  - Power Consumption: 50 Watts RMS
- RL2-18
  - Locking, rack-mount slide rails
  - Dual 18-inch full color LCD displays positioned side-by-side when in operation
  - Optional S-Video or RCA composite connection
  - Resolution: 1280 x 1024 (each display)
  - Refresh Rate: Up to 85Hz (each display)
  - White Luminance: 235 cd/m2 (each display)
  - Support Color: 16M (each display)

LCD / Keyboards

TAG 1U LCD / Keyboards come 15- and 18-inch configurations. The following lists the key features of each model. For additional information, refer to the TAG Website (**www.tag.com**).

- RLKM-18
  - Keyboard Type: Compact 104 Intel PS/2 keyboard w/ integrated scratchpad
  - Locking, rack-mount slide rails
  - VGA Interface: HD15
  - Resolution: 1024 x 768
  - Refresh Rate: 85Hz
  - White Luminance: 200 cd/m2
  - Support Color: 256k
  - Power Consumption: 50 Watts RMS
  - Folding 15-inch active matrix LCD
  - Constant torque LCD monitor hinges
  - Retractable cable management system
  - Also available with a USB compact keyboard

- RLKT-18
  - Keyboard Type: Intel PS/2 rugged keyboard w/ integrated trackball and three button mouse also available with a backlight
  - VGA Interface: HD15
  - Resolution: 1280 x 1024
  - Refresh Rate: 85Hz
  - White Luminance: 235 cd/m2
  - Support Color: 256k
  - Power Consumption: 50 Watts RMS
  - Locking, rack-mount slide rails
  - Folding 18-inch active matrix LCD
  - Constant torque LCD monitor hinges
  - Retractable cable management system
  - Also available with a USB rugged keyboard with integrated trackball and 3 button mouse
- RLSKT-18
  - Keyboard Type: Compact 104 Intel PS/2 keyboard w/ integrated scratchpad
  - Locking, rack-mount slide rails
  - VGA Interface: HD15
  - Resolution: 1280 x 1024
  - Refresh Rate: 85Hz
  - White Luminance: 200 cd/m2
  - Support Color: 256k
  - Power Consumption: 50 Watts RMS
  - Folding 18-inch active matrix LCD
  - Constant torque LCD monitor hinges
  - Retractable cable management system
  - Also available with a USB compact keyboard
- RLKM-15
  - Keyboard Type: Compact 104 Intel PS/2 keyboard w/ integrated scratchpad
  - Locking, rack-mount slide rails
  - VGA Interface: HD15
  - Resolution: 1024 x 768
  - Refresh Rate: 85Hz
  - White Luminance: 200 cd/m2
  - Support Color: 256k
  - Power Consumption: 50 Watts RMS
  - Folding 15-inch active matrix LCD

- RLKT-15
  - Keyboard Type: Intel PS/2 rugged keyboard w/ integrated trackball and three button mouse also available with a backlight
  - VGA Interface: HD15
  - Resolution: 1280 x 1024
  - Refresh Rate: 85Hz
  - White Luminance: 235 cd/m2
  - Support Color: 256k
  - Power Consumption: 50 Watts RMS
  - Locking, rack-mount slide rails
  - Folding 18-inch active matrix LCD
  - Constant torque LCD monitor hinges
  - Retractable cable management system
  - Also available with a USB rugged keyboard with integrated trackball and 3 button mouse
- RLKT-15-A
  - Locking, rack-mount slide rails
  - Retractable cable management system
  - Folding 15-inch active matrix LCD
  - Integrated trackball with two built-in mouse buttons
  - 1024 x 768 SVGA resolution
  - On-screen LCD display functions
  - Constant torque LCD monitor hinges
  - Compact 83 Key PS/2 keyboard
  - 12 function keys and numeric keypad
  - Also available with integrated sound
- RLSKT-15
  - Keyboard Type: Compact 104 Intel PS/2 keyboard w/ integrated scratchpad
  - Locking, rack-mount slide rails
  - VGA Interface: HD15
  - Resolution: 1024 x 768
  - Refresh Rate: 85Hz
  - White Luminance: 200 cd/m2
  - Support Color: 256k
  - Power Consumption: 50 Watts RMS
  - Folding 18-inch active matrix LCD
  - Constant torque LCD monitor hinges
  - Retractable cable management system
  - Also available with a USB compact keyboard

Power Requirements

12VDC is required, this should be a regulated supply. The power rating depends on the panel and inverter used. Normally, power supply with 3.5 Amp current output should be enough for most panels. Although the controller provides power regulation for the LCD power this does not relate to the power supplied to the backlight inverter. If an unregulated power supply is provided to an inverter any fluctuations in power may affect operation, performancem and lifetime of the inverter and or backlight tubes.

⚠ WARNING

The LCD is not a serviceable unit and contains dangerous voltages. Although only 12VDC is required as 'power-in' a backlight inverter for panel backlighting produces significantly higher voltages. Do not attempt to service or repair an LCD. Failure to follow these instructions could result in serious injury due to electrical shock.

CAUTION

Never connect or disconnect parts of the display system when the system is powered up as this may cause serious damage.

Display Adjustments

The video display controlled by the front panel controls, positioned on the lower portion of the LCD. Figure 5-1 and Figure 5-2 show and the front panel display controls. Figures 5-3 through 5-3 show the on-screen display (OSD) controls that are accessed via the **Menu** button.

The controller has been designed to take a very wide range of input signals however to optimize the PC's graphics performance we recommend choosing 60Hz vertical refresh rate—this will not cause screen flicker.

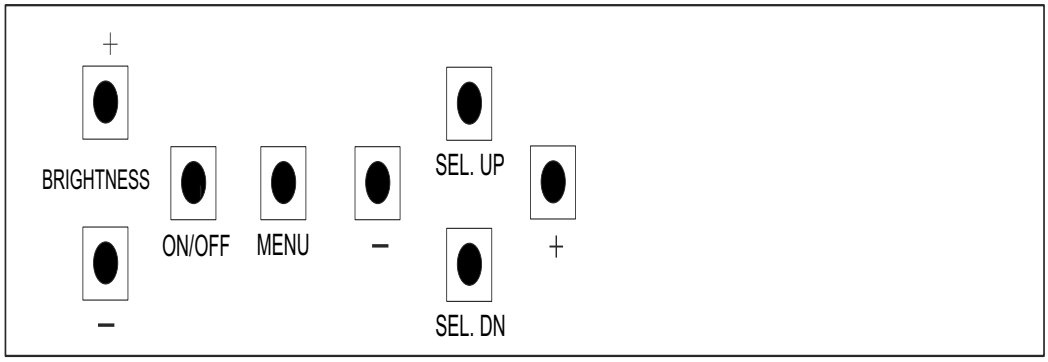


Figure 5-2: Front Panel Video Display Controls

To turn on the OSD menu:	Press the MENU button
Move to next icon:	Press the MENU button
Select options within icon menu:	Use SEL UP/SEL DN buttons, the selected option is in yellow.
Increase/decrease setting:	Use +/- buttons
Move selection left/right:	Use +/- buttons, the selected option is in green

	Brightness and Contrast : Brightness Increase/decrease panel brightness level, total: 100 steps Contrast Increase/decrease panel contrast level, total: 100 steps
	Color Temperature : 9500K / 8000K / 6500K / 5000K Adjust the warmness of the image displayed. The higher temperature the coolest image looks like. The lower temperature the warmest image looks like.
	Video Adjustment : (DISPLAYED IN VIDEO MODE ONLY) Color: adjust video color level Tint: adjust video tint level Sharpness: adjust video image sharpness level Picture Type : Motion / Still Select still mode to getting a stable image in displaying still picture Video Type: DVD / VCR Change brand width to match the source
	Frequency and Phase : (DISPLAYED IN PC MODE ONLY) Frequency Adjust the image horizontal size Phase Fine tune the data sampling position (adjust image quality) Picture Type : Motion / Still Select still mode to getting a stable image in displaying still picture
	Video System : Select video system and input signals (DISPLAYED IN VIDEO MODE ONLY) AUTO : automatic detection of NTSC and PAL system (not applicable in SECAM system) NTSC / NTSC 4.43 : manual select NTSC system PAL / PAL M : manual select PAL system SECAM : manual select SECAM system
	Status : (DISPLAYED IN PC MODE ONLY) Display graphic information: resolution and frequency
	Position : Image up/down : Use SEL UP/SEL DN to move the image vertically Image left/right : Use +/- to move the image horizontally
	Rotation : (DISPLAYED IN VIDEO MODE ONLY) Rotates the image from landscape format to portrait format.

Figure 5-3: OSD Menu (Sheet 1 of 3)

Picture in Picture : (DISPLAYED IN PC MODE ONLY)

PIP Size : Off / 1 / 2 / 3 — Select PIP window size: close, size 1, size 2 and size 3
PIP Source : — Select video source to be display in PIP window:
- Auto – automatic detection of Composite, S-video and Component
- Composite – manual select composite video only
- SVideo – manual select S-video only
- YCbCr/RGB* – manual select YCbCr

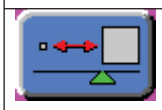
** RGB only applicable in SV-1600*

Horizontal Position adjust the position of the PIP window horizontally

Vertical Position adjust the position of the PIP window vertically

Advanced PIP Settings :

- Brightness adjust the image brightness of the PIP window
- Contrast adjust the image contrast of the PIP window
- Sharpness adjust the image sharpness of the PIP window
- Tint adjust the tint of the image of the PIP window
- Color adjust the color of the image of the PIP window

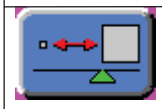


Video Scaling : (DISPLAYED IN VIDEO MODE ONLY)

Use the UP and DOWN arrow keys to select the following scaling modes.

Normal
Letterbox
Letterbox with Subtitles

Nonlinear Scaling Modes : Horiz Clipping / Horiz Offset / Horiz Stretch / Vert Clipping / Vert Offset / Vert Stretch



Graphic Scaling Modes : (DISPLAYED IN PC MODE ONLY)

Use the up and down arrow keys to choose a scaler mode.
Use the + or - key to modify a following scaler parameters.

One to One :

Horizontal Pan

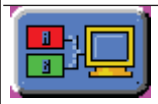
Vertical Pan

Fill Screen : enable full screen expansion for lower resolution Image
Fill to Aspect ratio : enable fill screen expansion for lower resolution image according to aspect ratio.

Nonlinear Scaling Modes : Horiz Clipping / Horiz Offset / Horiz Stretch / Vert Clipping / Vert Offset / Vert Stretch

Language : Select OSD menu language display

1. English
2. Danish
3. Chinese



Video source : Select the input video signal

Analog RGB / Component Video / Composite Video / S-Video

Figure 5-4: OSD Menu (Sheet 2 of 3)

Utilities :

User Setting : User Timeout : adjust the OSD menu timeout period in a step of 5 seconds
DPMS : Disable / Enable the DPMS function
Display Input : Disable / Enable the input source name on screen

Auto Source Select : Off - Disable auto source select function.
Low - Auto source select enable ONLY in power up.
High - Auto source select ALWAYS enable.

Gamma : 1.0 (Default setting)
1.6
2.2

OSD Setting : OSD Horz Position : move the OSD menu horizontally
OSD Vert Position : move the OSD menu vertically
OSD Background : Translucent / Opaque
OSD Rotate : Normal / Rotate

Freeze : Freeze the image (use "+" button)

Zoom : Zoom level : enable the zoom in function on the image displayed.
Use "+" button to zoom in the image.
Use "-" button to decrease the zoomed image.

Horizontal Pan :
Vertical Pan :

Direct Access #1: Define the hot key function ("+" and "-") for one of the following adjustments : Brightness / Contrast / Volume / Freeze / Zoom / Video Source* / PIP

Direct Access #2: Define the hot key function ("SEL UP" and "SEL DN") for one of the following adjustments : Brightness / Contrast / Volume / Freeze / Zoom / Video Source* / PIP

Display Orientation : Normal / Horizontal Inverse / Vertical Inverse / Inverse

Calibrate RGB Gain : Color Calibration (DISPLAYED IN PC MODE ONLY)

Load Factory Defaults : Recall factory default settings.

* By pressing the hot key, the source is in sequence of Analog RGB/Composite Video/S-Video/Component Video.

Volume :

Adjust the audio volume level (functions only if the audio add-on installed)

Exit menu

Figure 5-5: OSD Menu (Sheet 2 of 3)

Servicing

The LCD is not user serviceable or repairable. Warranty does not cover user error in connecting up to the controller and is invalidated by unauthorized modification or repairs. Contact TAG Technical Support at **tech.support@tag.com** to arrange to have your LCD / Keyboard serviced. For more information, see *Contacting TAG* on page vii.

Troubleshooting

When troubleshooting a flat panel display system it is worth considering the system as separate elements, such as:

- Controller (jumpers, PC settings)
- Panel (controller, cabling, connection, panel, PC settings)
- Backlight (inverter, cabling, backlight tubes)
- Cabling
- Computer system (display settings, operating system)

Through step by step cross checking with instruction manuals and a process of elimination to isolate the problem it is usually possible to clearly identify the problem area.

No Image

If the panel backlight is not working it may still be possible to see some image on the display.

A lack of image is most likely caused by an incorrect connection, lack of power, failure to provide a signal, or incorrect graphic card settings.

Image Position

If it is impossible to position the image correctly, i.e., the image adjustment controls will not move the image far enough, then test using another graphics card. This situation can occur with a custom graphics card that is not close to standard timings or if something is in the graphics line that may be affecting the signal such as a signal splitter (normally a signal splitter will not have any adverse effect).

Image appearance

A faulty panel can have blank lines, failed sections, flickering or flashing display. Incorrect graphics card refresh rate, resolution or interlaced mode will probably cause the image to be the wrong size, to scroll, flicker badly, or possibly no image.

Sparkling on the display: faulty panel signal cable.

Backlight

Items to check include: Power input, Controls, Inverter and Tubes generally in this order.

- If half the screen is dimmer than the other half check cabling for the inverter.

Continued Failure

If you are still unable to isolate the problem, contact TAG Technical Support at **tech.support@tag.com** to arrange to have your LCD serviced. For more information, see *Contacting TAG* on page vii.